

Abstract

Title: Profile and analysis of the relationship between strength and speed of American Football players.

Aims: The main aim of this study was to analyse the profile and relationship between strength and speed of American Football players. The research was taken to find, to what extent does strength and speed correlate including the test battery and if so, does the higher level influence results of the motoric tests.

Methods: In our research we applied methods of analysis and comparison. The method of analysis was used in detailed breakdown of the measured results of the motoric tests. The comparison method was used to determine relationships between specific motoric tests. We carried the basic statistical processes of the measured data, which included calculation of the measurement of arithmetic mean, mode, median, minimum and maximum value, upper and lower quartile and variables. Range of scatter, deviation and quartile range together with variation coefficient. Relationships between motoric tests have been calculated by Pearson's correlation coefficient.

Results: Statistically significant correlations were found between the tests of linear speed - 10 and 40 yard dash ($r = 0.86$) and tests of agility- 20 yard shuttle a 3 cone drill ($r = 0.77$). The correlation approached significance between other speed tests – agility, sprints and broad jump ($r = 0.55 - 0.76$). Broad jump, which measures explosive power ability of lower body, significantly correlated with tests of linear speed ($r = - 0.61$ to -0.76) and tests of agility ($r = - 0.60$ to -0.62). Statistically significant correlations were found between Olympic- weightlifting exercises. Bench press has been strongly correlated with all strength exercises ($r = 0.71 - 0.89$).

Statistically significant correlation between squats, dead lift and hang clean ($r=0.74 - 0.78$) proved, that similar abilities were measured. From results in absolute values we found nonsignificant correlations between most of the strength and speed tests ($r= -0.29 - 0.12$). Statistically significant correlations were found between speed and strength tests by using the values of relative strength 1 RM/BM ($r= -0.66 - 0.38$). Players, who ran 40 yard dash < 5 sec., had outstanding results in absolute and relative strength (1 RM/BM). On the other hand players who ran 40 yard dash > 5.5 sec had under average results in absolute and relative strength. Also those, who jumped broad jump less than 220 cm reached under-average results in absolute and relative strength. The best combine results were measured from players DB (defensive backs). They had also outstanding results in absolute and relative strength (1 RM/BM): bench press (1.30), squat (1.79), dead lift (1.81) a hang clean (1.04). Players, who ran first 10 yards of the 40 yard dash ≤ 1.65 reached outstanding strength results in absolute and relative strength. Also players with higher maximal squat 1 RM/BM were faster in short linear distances (10 a 40 yard dash).

Conclusion: Statistically significant correlations were found between the tests of linear speed ($r= 0.86$) and tests of agility ($r= 0.77$). The correlation approached significance between other speed tests – agility, sprints and broad jump ($r= 0.55 - 0.76$). Statistically significant correlations were found between Olympic- weightlifting exercises ($r= 0.71- 0.89$). It proved, that similar abilities were measured. From results in absolute values we found nonsignificant correlations between most of the strength and speed tests ($r= -0.29 - 0.12$). Statistically significant correlations were found between speed and strength tests by using the values of relative strength 1 RM/BM ($r= -0.66 - 0.38$).

Keywords: combine, sprint, agility, motoric abilities, olympic-weightlifting exercises, power, Pearson's correlation coefficient